UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/972,203	10/09/2001	Timothy E. Bishop	P 283694 D1056-CIP	3568

909 7590 02/12/2004

PILLSBURY WINTHROP, LLP
P.O. BOX 10500
MCLEAN, VA 22102

EXAMINER	
MCCLENDON, SANZA L	
ART UNIT	**PAPER NUMBER**
1711	

DATE MAILED: 02/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/972,203	BISHOP ET AL.	
	Examiner	Art Unit	
	Sanza L McClendon	1711	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-29* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *21 and 22* is/are allowed.

6)☐ Claim(s) *1-4,7-20,23 and 26-29* is/are rejected.

7)☒ Claim(s) *5,6,24 and 25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 10/04/01 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-4, 7-9, 12-20, 23, and 26-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snowwhite et al (6,136,880).

Snowwhite et al teaches radiation curable liquid resin compositions for optical fibers. Said liquid resin composition comprises from 10 wt% to 90 wt% of a polyurethane acrylate, from 10wt% to 90wt% of at least one radiation curable monomer diluent and an effective amount of a phosphine oxide photoinitiator having the formula found in the abstract. Said polyurethane acrylate has a molecular weight between 1,000 to about 8,000 Daltons and is the reaction product of an oligomer polyol, a diisocyanate, and a hydroxyl functional ethylenically unsaturated monomer, such as a hydroxyalkyl (meth) acrylate. Said oligomeric polyol is preferably a polyether polyol, such as polytetramethylene glycol—see column 7, lines 10-20 and 50-65. Snowwhite et al teaches, in addition to the preferred polyether polyol, other oligomeric polyols such as polyester, polycarbonate and polyolefin polyols can be used in combination with said polyether polyol. The preferred diisocyanates can be chosen from those listed in column 10, lines 27-31, wherein isophorane, methylene bis (4-cyclohexylisocyanate) and toluene diisocyanate are taught. The reactive diluents can be found in column 12, lines 36 to the end, wherein nonylphenol PO modified acrylate is taught. In addition to the above listed reactive diluents Snowwhite et al teaches that di-functional reactive diluents, such as hexanediol diacrylate can be used. Snowwhite et al teaches in

addition to the phosphine oxide photoinitiator of formula (1) other free radical photoinitiators such as those listed in column 16, lines 35 to 55 can be used in combination with said phosphine oxide. In addition other commonly used additive such as silane coupling agents and others listed in column 17, lines 40-45 can be used in said coating composition. Per examples 1, 5, 7, 8, 9, and 14, Snowwhite et al teaches using polytetramethylene glycol in the synthesis of the polyurethane acrylate. Snowwhite et al teaches using combination of photoinitiators. Therefore it would have been obvious to one skilled in the art at the time of the invention to employ combinations of any photoinitiators taught by Snowwhite et al for the following reasons. Snowwhite et al teaches that in addition to the phosphine oxide other free radical photoinitiators can be used in the radiation curable composition. It is well known in the photopolymerization art to use different kinds of photoinitiators to take advantage of different known properties, such as sensitivity to different wavelengths of light. Acylphosphine oxides, for example, are well known for the ability to provide depth of cure or cure in the presence of pigments and for being useful in combination with phenyl ketone photoinitiators. The motivation for using combination of photoinitiators would have been a reasonable expectation of a faster and more complete cure of said resin compositions in the absence of evidence to the contrary and/or unexpected results. With regard to claim 16, the combination of initiators as taught by Snowwhite et al should inherently cure faster than a comparable composition employing only hydroxy-cyclohexyl-phenyl ketone as a photoinitiator. It is deemed that Snowwhite et al reads on claims 13-16 because Snowwhite et al teaches a composition that reads on the instant composition therefore the compositions of Snowwhite should have the same percentage reacted acrylate unsaturation when cured at a does of about 4.4 mJ/cm2 in the absence of evidence to the contrary.

Note: This application presents comparable data (specifically examples 8-9) to show that the cure rate is improved when a specific combination of photoinitiators employed is used. However claim 16 is not commensurate in scope with the evidence of unexpected results (i.e. example 8 has 5 photoinitiators in an amount of 4.5-wt% and example 9 has four photoinitiators in an amount of 3.0-wt% while the comparative example uses hydroxy-cyclohexylphenyl ketone in amount of 4.0-wt%).

3. Claims 1-4, 8-9, 12-16, and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Snowwhite et al (6,359,025).

Snowwhite et al teaches radiation curable liquid resin compositions for optical fiber coatings. Snowwhite et al teaches using a radiation curable urethane acrylate oligomer, a radiation curable monomer diluent and an effective amount of photoinitiator represent by formula 1 found in the abstract. Said polyurethane acrylate has a molecular weight between 1,000 to about 8,000 Daltons and is the reaction product of an oligomer polyol, a diisocyanate, and a hydroxyl functional ethylenically unsaturated monomer, such as a hydroxyalkyl (meth) acrylate. Said oligomeric polyol is preferably a polyether polyol, such as polytetramethylene glycol—see column 7, lines 10-20 and 50-65. Snowwhite et al teaches, in addition to the preferred polyether polyol, other oligomeric polyols such as polyester, polycarbonate and polyolefin polyols can be used in combination with said polyether polyol. The preferred diisocyanates can be chosen from those listed in column 10, lines 27-31, wherein isophorane, methylene bis (4-cyclohexylisocyanate) and toluene diisocyanate are taught. The reactive diluents can be found in column 12, lines 36 to the end, wherein nonylphenol PO modified acrylate is taught. In addition to the above listed reactive diluents Snowwhite et al teaches that di-functional reactive diluents, such as hexanediol diacrylate can be used. Snowwhite et al teaches in addition to the phosphine oxide photoinitiator of formula (1) other free radical photoinitiators such as those listed in column 16, lines 35 to 55 can be used in combination with said phosphine oxide. In addition other commonly used additive such as silane coupling agents and others listed in column 17, lines 40-45 can be used in said coating composition. Per examples 1, 5, 7, 8, 9, and 14, Snowwhite et al teaches using polytetramethylene glycol in the synthesis of the polyurethane acrylate. Snowwhite et al teaches using combination of photoinitiators. Therefore it would have been obvious to one skilled in the art at the time of the invention to employ combinations of any photoinitiators taught by Snowwhite et al for the following reasons. Snowwhite et al teaches that in addition to the phosphine oxide other free radical photoinitiators can be used in the radiation curable composition. It is well known in the photopolymerization art to use different kinds of photoinitiators to take advantage of different known properties, such as sensitivity to different wavelengths of light. Acylphosphine oxides, for example, are well known for the ability to provide depth of cure or cure in the presence of pigments and for being useful in combination with phenyl ketone photoinitiators. The motivation for using combination of photoinitiators would have been a

reasonable expectation of a faster and more complete cure of said resin compositions in the absence of evidence to the contrary and/or unexpected results. With regard to claim 16, the combination of initiators as taught by Snowwhite et al should inherently cure faster than a comparable composition employing only hydroxy-cyclohexyl-phenyl ketone as a photoinitiator. It is deemed that Snowwhite et al reads on claims 13-16 because Snowwhite et al teaches a composition that reads on the instant composition therefore the compositions of Snowwhite should have the same percentage reacted acrylate unsaturation when cured at a does of about 4.4 mJ/cm2 in the absence of evidence to the contrary.

4. Claims 1, 3-4, 8-9, 13-17 and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al (6,057,034).

Yamazaki et al teaches compositions for coating optical fibers comprising a combination of photoinitiators. Per the examples Yamazaki et al teaches reacting polytetramethylene glycol with diisocyanates such as hexamethylene diisocyanate, isophorane diisocyanate and toluene diisocyanate and with a hydroxy alkyl acrylate to obtain a polyurethane acrylate, which anticipates claims 1, 8, and 18-19 and having a molecular weight that read on those found in the claims. The photoinitiators disclosed by applicant, including phenyl ketones, acylphosphine oxide, and oligomeric photoinitiator, re disclosed by Yamazaki et al. See columns 9-10 and the examples, wherein Yamazaki et al specifically mentions commercial combination of photoinitiators in column 10, lines 9-12. Thus it would have been obvious to a skilled artisan at the time of the invention to use combination of any of the photoinitiators taught by Yamazaki et al for the following reasons. Yamazaki et al teaches that of photoinitiators disclosed is useful in the disclosed compositions, the photoinitiators can be used in combination and use of combination of photoinitiators in the examples. It is well known in the photopolymerization art to use different kinds of photoinitiators to take advantage of different known properties, such as sensitivity to different wavelengths of light. Acylphosphine oxides, for example, are well known for the ability to provide depth of cure or cure in the presence of pigments and for being useful in combination with phenyl ketone photoinitiators. The motivation for using combination of photoinitiators would have been a reasonable expectation of a faster and more complete cure of said resin compositions in the absence of evidence to the contrary and/or unexpected

results. It is deemed that Yamazaki et al reads on claims 13-16 because Yamazaki et al teaches a composition that reads on the instant composition therefore the compositions of Yamazaki et al should have the same percentage reacted acrylate unsaturation when cured at a does of about 4.4 mJ/cm2 in the absence of evidence to the contrary.

5. Claims 1, 3, 8, and 10-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Moschovis et al (4,782,129).

Moschovis et al teaches buffer coating compositions for optical fibers. Said composition comprises an acrylated-capped polyurethane in admixture with a monoethylenically unsaturated monomer. Said polyurethane is the reaction product of an organic diisocyanate with a modified diol and a hydroxyalkyl acrylate. Said modified diol is the diester reaction product of polyoxytetrmethylene glycol with a long chain ester forming hydrocarbon-substituted dicarboxylic acid or a ester forming substitution product thereof. The dicarboxylic acid can be succinic acid or adipic acid. The organic diisocyanate can be a toluene diisocyanate, isophorane diisocyanate, a dimer fatty acid diisocyanate and, as seen in the examples, saturated methylene diphenyl diisocyanate, wherein some are deemed to read on those found in the claims. In addition to the modified diol, other diols, such as 1,6-hexane diol and trimethylolpropane in amounts up to 10% of the total amount of difunctional reactants in the polyurethane, can be used for making the polyurethane. It is deemed that applicant' s component proportions are read by the general disclosure as taught by Moschovis in the absence of arguments to the contrary. Per examples, Moschovis et al teaches using a silane-coupling agent (e.g., methacrylate ester of gamma hydroxylpropyl trimethoxy silane). Moschovis et al teaches using photoinitiators as a component in said compositions. Moschovis et al teaches using photoinitiator combination of Irgacure 907 with isopropylthioxanthone, in addition also phosphine oxides and hydroxylcyclohexyl phenyl ketone are also useful. Moschovis et al teaches that said photoinitiators could be used alone or in admixture with one another. Thus it would have been obvious to a skilled artisan at the time of the invention to use combination of any of the photoinitiators taught by Moschovis et al for the following reasons. Moschovis et al teaches that of photoinitiators disclosed is useful in the disclosed compositions, the photoinitiators can be used in combination and use of combination of photoinitiators in the examples. It is well known in the photopolymerization art to use different kinds of photoinitiators to take advantage of different known

properties, such as sensitivity to different wavelengths of light. Acylphosphine oxides, for example, are well known for the ability to provide depth of cure or cure in the presence of pigments and for being useful in combination with phenyl ketone photoinitiators. The motivation for using combination of photoinitiators would have been a reasonable expectation of a faster and more complete cure of said resin compositions in the absence of evidence to the contrary and/or unexpected results. It is deemed that Moschovis et al reads on claims 13-16 because Moschovis et al teaches a composition that reads on the instant composition therefore the compositions of Moschovis et al should have the same percentage reacted acrylate unsaturation when cured at a does of about 4.4 mJ/cm2 in the absence of evidence to the contrary.

Allowable Subject Matter

6. Claims 5-6 and 24-25 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: The prior art fails to teach a radiation curable oligomer having the individual proportion amounts found in claims 5-6 and 25. Nor using a polydimethyl siloxane in a composition as taught in claim 23.

8. Claims 21-22 are allowed.

9. The following is an examiner' s statement of reasons for allowance: The primary reasons for allowance is the radiation curable oligomer comprising from 10-30 wt% of isophorane diisocyanate, 5-15 wt% of dicyclohexylemthane diisocyanate, 45-75 wt% of polytetramethylene glycol and 5-20 wt% of hydroxyethylacrylate, which when cured at a dose of about 4.4 mJ/cm2 has a percentage reacted acrylate unsaturation of at least 60%.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sanza L McClendon whose telephone number is (571) 272-1074. The examiner can normally be reached on Monday through Friday 8:00 to 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on (703) 308-2462. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sanza L McClendon
Examiner
Art Unit 1711

SMc

James J. Seidleck
Supervisory Patent Examiner
Technology Center 1711